

REMARKS

Claims 1-34 remain pending in the application.

Claims 1-3, 5, 10-12, 14, 20, 23-25 and 32 over Bingel

In the Office Action, claims 1-3, 5, 10-12, 14, 20, 23-25 and 32 were rejected under 35 U.S.C. §102(e) as allegedly being anticipated by U.S. Patent No. 6,173,021 to Bingel et al. ("Bingel"). The Applicants respectfully traverse the rejection.

Claims 1-3, 5, 10-12, 14, 20, 23-25 and 32 recite a method and apparatus to output a signal representative of AM interference and to generate an AM interference cancellation signal that is based on a carrier component of an AM interference signal while ignoring a sideband component.

Bingel discloses a system and method of eliminating AM interference within a digital subscriber line (See Abstract; col. 1, lines 34-44). A differential transmitter located at a central office outputs signals to a differential receiver (See Bingel, col. 3, lines 2-5). A detector detects broad and local area interference being coupled into a twisted pair and generates an analog signal relating to the detected interference signal (See Bingel, col. 3, lines 15-17). The analog signal is sampled and scaled to produce an interference cancellation signal (See Bingel, col. 3, lines 17-20).

Thus, Bingel discloses detecting an interference signal that exists between a differential transmitter and a differential receiver. However, Bingel fails to even mention a carrier component and a sideband component of AM interference, much less disclose or suggest a method and apparatus to output a signal representative of AM interference and to generate an AM interference cancellation signal that is based on a carrier component of an AM interference signal while ignoring a sideband component, as recited by claims 1-3, 5, 10-12, 14, 20, 23-25 and 32.

A benefit of AM interference cancellation that is based on a carrier component of an AM interference signal while ignoring a sideband component of is, e.g., simplification. Sideband components of AM interference contribute little to overall AM interference. Thus, ignoring sideband components eliminates

having to determine what sideband components to process and processing of sideband components. Without having to determine and process a sideband component of AM interference, AM interference can be processed more quickly with a simpler system, i.e., reduced costs. The prior art fails to disclose or suggest the claimed features having such benefits.

Accordingly, for at least all the above reasons, claims 1-3, 5, 10-12, 14, 20, 23-25 and 32 are patentable over the prior art of record. It is therefore respectfully requested that the rejection be withdrawn.

Claims 4, 6, 13, 15, 21, 22 and 33 over Bingel in view of Yeap

In the Office Action, claims 4, 6, 13, 15, 21, 22 and 33 were rejected under 35 U.S.C. §103(a) as allegedly being obvious over Bingel in view of U.S. Patent No. 6,052,420 to Yeap et al. ("Yeap"). The Applicants respectfully traverse the rejection.

Claims 4, 6, 13, 15, 21, 22 and 33 are dependent on claims 1, 10, 20 and 32 respectively, and are allowable for at least the same reasons as claims 1, 10, 20 and 32.

Claims 4, 6, 13, 15, 21, 22 and 33 recite a method and apparatus to output a signal representative of AM interference and to generate an AM interference cancellation signal that is based on a carrier component of an AM interference signal while ignoring a sideband component.

As discussed above, Bingel fails to disclose or suggest a method and apparatus to output a signal representative of AM interference and to generate an AM interference cancellation signal that is based on a carrier component of an AM interference signal while ignoring a sideband component of, as recited by claims 4, 6, 13, 15, 21, 22 and 33.

The Office Action relies on Yeap to allegedly make up for the deficiencies in Bingel to arrive at the claimed invention. The Applicants respectfully disagree.

Yeap appears to disclose a noise suppression circuit for a two-wire communications channel (Abstract). Common mode noise is estimated by

adding an in-phase TIP signal and an anti-phase RING signal in a twisted pair cable with respect to ground reference (Yeap, col. 6, lines 7-9). Within a noise estimator, the common mode signal is filtered in an adjustable bandpass filter band and phase inverted by an adjustable inverter unit (Yeap, col. 6, lines 16-18). The control unit controls an adjustable gain unit so as to adjust the amplitude of the noise estimate signal to an approximate level to cancel the differential mode noise in the differential mode signal (Yeap, col. 6, lines 46-49). A hybrid outputs a differential mode signal to a summer, the summer summing the differential mode signal with the noise estimate signal to cancel the differential mode noise (Yeap, Fig. 2).

Yeap detects AM interference on a subscriber loop with a noise estimator and subsequently filters the noise by adjusting a bandpass filter. However, Yeap, like Bingel, fails to even mention carrier components and sideband components of AM interference, much less disclose or suggest a method and apparatus to output a signal representative of AM interference and to generate an AM interference cancellation signal that is based on a carrier component of an AM interference signal while ignoring a sideband component, as recited by claims 4, 6, 13, 15, 21, 22 and 33.

Therefore, even if it were obvious to modify Bingel with the disclosure of Yeap (which it is not), the theoretical result would still fail to disclose or suggest a method and apparatus to output a signal representative of AM interference and to generate an AM interference cancellation signal that is based on a carrier component of an AM interference signal while ignoring a sideband component, as recited by claims 4, 6, 13, 15, 21, 22 and 33.

Accordingly, for at least all the above reasons, claims 4, 6, 13, 15, 21, 22 and 33 are patentable over the prior art of record. It is therefore respectfully requested that the rejection be withdrawn.

Claims 7-9, 16-18, 26-29 and 34 over Yeap in view of Shenoi

In the Office Action, claims 7-9, 16-18, 26-29 and 34 were rejected under 35 U.S.C. §103(a) as allegedly being obvious over Yeap in view of U.S. Patent No. 5,764,704 to Shenoi ("Shenoi"). The Applicants respectfully traverse the rejection.

Claims 7-9, 16-18, 26-29 and 34 are dependent on claims 1, 10, 20 and 32 respectively, and are allowable for at least the same reasons as claims 1, 10, 20 and 32.

Claims 7-9, 16-18, 26-29 and 34 recite a method and apparatus to output a signal representative of AM interference and to generate an AM interference cancellation signal that is based on a carrier component of an AM interference signal while ignoring a sideband component for a digital subscriber line.

As discussed above, Yeap fails to disclose or suggest a method and apparatus to output a signal representative of AM interference and to generate an AM interference cancellation signal that is based on a carrier component of an AM interference signal while ignoring a sideband component, as recited by claims 7-9, 16-18, 26-29 and 34.

The Office Action relies on Shenoi to allegedly make up for the deficiencies in Yeap to arrive at the claimed invention. The Applicants respectfully disagree.

Shenoi is relied on to allegedly disclose a Hilbert bandpass filter for performing narrowband filtering of periodic carrier type signals at col. 2, lines 18-28 (See Office Action, page 6). However, Shenoi is completely unrelated to solving any type of problem associated with a digital subscriber line, i.e., generating a signal representative of AM interference and an AM cancellation signal for a digital subscriber line, much less disclose or suggest a method and apparatus to output a signal representative of AM interference and to generate an AM interference cancellation signal that is based on a carrier component of an AM interference signal while ignoring a sideband component, as recited by claims 7-9, 16-18, 26-29 and 34.

At best, theoretically modifying Yeap with the disclosure of Shenoi (which would be non-sensical since the two systems are completely unrelated) would result in a DSL interference cancellation with digital signal processing for FM demodulation. Yeap modified by the disclosure of Shenoi would fail to disclose or suggest a method and apparatus to output a signal representative of AM interference and to generate an AM interference cancellation signal that is based on a carrier component of an AM interference signal while ignoring a sideband component, as recited by claims 7-9, 16-18, 26-29 and 34.

Accordingly, for at least all the above reasons, claims 7-9, 16-18, 26-29 and 34 are patentable over the prior art of record. It is therefore respectfully requested that the rejection be withdrawn.

Claims 19, 30 and 31 over Bingel in view of Yeap and Srinivasagopalan

In the Office Action, claims 19, 30 and 31 were rejected under 35 U.S.C. §103(a) as allegedly being obvious over Bingel in view of Yeap, and further in view of Srinivasagopalan et al., U.S. Patent No. 4,689,804 (“Srinivasagopalan”). The Applicants respectfully traverse the rejection.

Claims 19, 30 and 31 are dependent on claims 10 and 20 respectively, and are allowable for at least the same reasons as claims 10 and 20.

Claims 19, 30 and 31 recite disclose or suggest a method and apparatus to output a signal representative of AM interference and to generate an AM interference cancellation signal that is based on a carrier component of an AM interference signal while ignoring a sideband component for a digital subscriber line.

As discussed above, Bingel in view of Yeap fails to disclose or suggest a method and apparatus to output a signal representative of AM interference and to generate an AM interference cancellation signal that is based on a carrier component of an AM interference signal while ignoring a sideband component for a digital subscriber line, as recited by claims 19, 30 and 31.

The Office Action relies on Srinivasagopalan to allegedly make up for the deficiencies in Bingel in view of Yeap to arrive at the claimed invention. The Applicants respectfully disagree.

Srinivasagopalan appears to disclose an apparatus for cancellation of sinusoidal varying phase jitter in a data modem (Abstract). An estimate of the frequency and phase of the phase jitter is computed in a first and second stage (Srinivasagopalan, Abstract). These estimates are combined to form a composite estimate of the phase jitter that are used to cancel out the sinusoidal phase jitter in a demodulator (Srinivasagopalan, Abstract).

Srinivasagopalan discloses reducing phase jitter in a conventional PBX data transmission, NOT in a digital subscriber line. Srinivasagopalan fails to disclose or suggest noise cancellation for a digital subscriber line, and therefore is non-analogous art with no suggestion of canceling AM interference in a digital subscriber line.

Thus, even Bingel in view of Yeap and Srinivasagopalan (if they were obvious to combine, which they are not) would still fail to disclose or suggest a method and apparatus to output a signal representative of AM interference and to generate an AM interference cancellation signal that is based on a carrier component of an AM interference signal while ignoring a sideband component for a digital subscriber line, as recited by claims 19, 30 and 31.

Accordingly, for at least all the above reasons, claims 19, 30 and 31 are patentable over the prior art of record. It is therefore respectfully requested that the rejection be withdrawn.

Conclusion

All objections and rejections having been addressed, it is respectfully submitted that the subject application is in condition for allowance and a Notice to that effect is earnestly solicited.

Respectfully submitted,
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